S/194/62/000/004/025/105
D222/D309

16,6000

AUTHORS: Avramescu, Aurel and Leon, Mihai

TITLE: New criteria for the characteristics of the transient processes in automatic systems

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 4, 1962, abstract 4-2-73y (Probl. automat., 1960, no. 4, 5-24)

TEXT: Many textbooks make reference to the analytical derivation of parameters characterizing the transient processes in automatic systems. It is asserted that none of these methods is sufficiently convincing. It is shown in this paper that it is possible to establish such criteria and parameters which are based on the internal properties of the elements and of the automatic system, and which are in a mutual relationship with the variables and analytical expressions characterizing the latter. The following concepts are introduced: The transient process time in the system, the rise time, the time constant, the time until the first maximal peak,

Card 1/2

HÖFLER, E.; AVCIN, F.; MIKLAVZIC, U.; PONIZ, R.; GOSAR, P.; GRUDEN, M.; DOBEIC, J.; VAJDA, B.; ILAKAR, F.; VIRANT, J.; VDOVIC, J.; JEREB, P.; GERLANC, I.; STARIC, P.; SKUBIC, T.; MAGAJNA, B.; KERSIC, N.; LEONARDIS, S.; PIRKMAJER, E.; CAJHEN, R.

New books and periodicals. Elektr vest 17 no.1/2:46-56 Ja-F '64.

LEONARDIS, S.

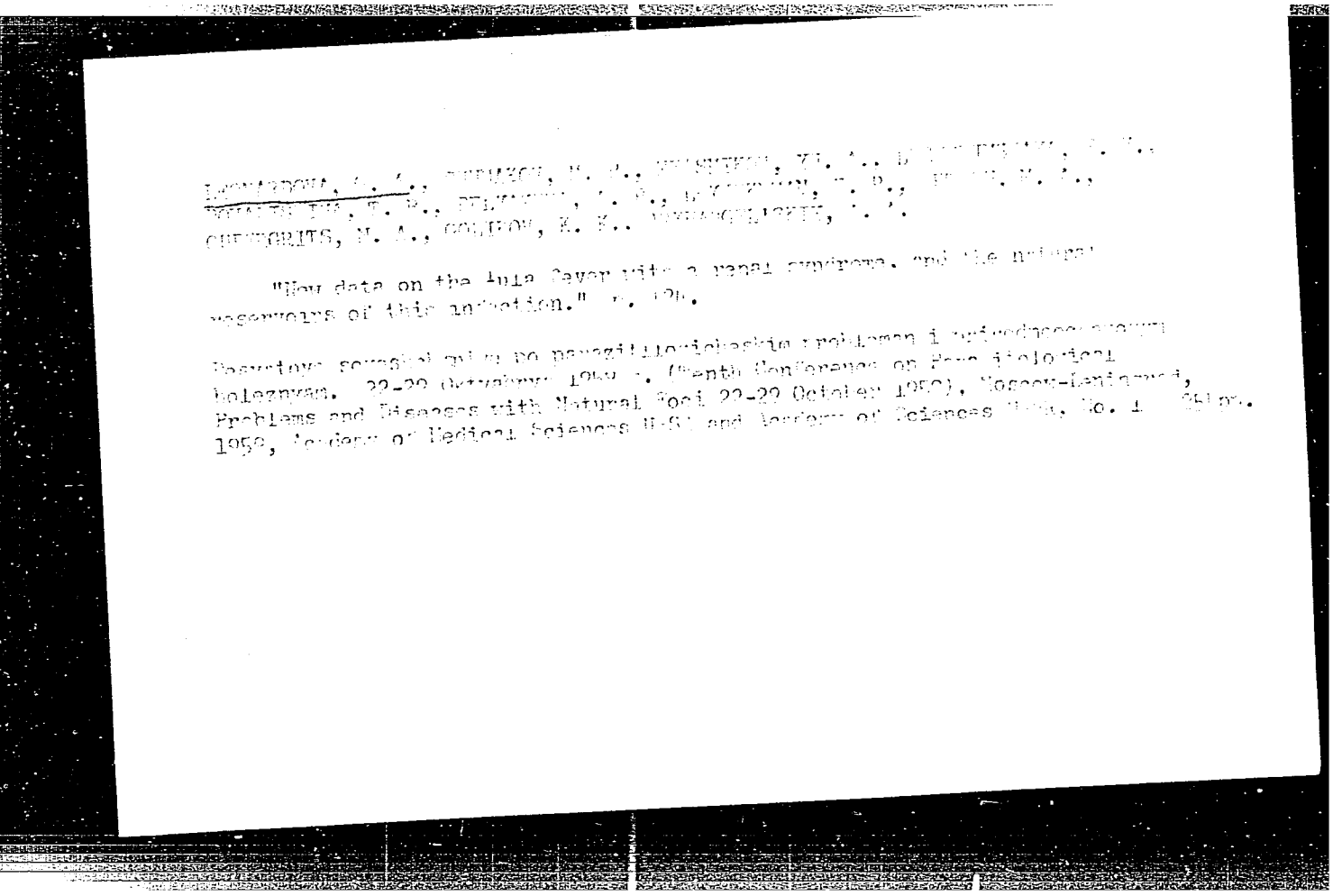
"Special semiconductor elements" by M. Ulrych. Reviewed by S. Leonardis. Elektr vest 30 no. 10/12:323.'62/'63.

SHAFRANSKIY, L.L., LEONARDOV, A.L.

"Injuries of the face and jaws and their treatment" by N.M. Mikhel'son. (MIRA 11:7)
Sov.med. 22 no.5:149-152 My '58
(HEAD--WOUNDS AND INJURIES)
(MIKHEL'SON, N.M.)

LEONARDOV, A.L., vrach (Vinnitsa)

Use of bencaine in stomatological practice. Probl. stomatol. i khir. no.1:14-16 '65. (MIRA 18:10)



SOV/55-58-1-14/33

AUTHOR: Leonas, V.B.

TITLE: On the Propagation of Shock Explosions in Channels With Uneven Walls (O rasprostranenii udarnykh razryvov v kanalakh s negladkimi stenkami)

PERIODICAL: Vestnik Moskovskogo universiteta, Seriya fiziko-matematicheskikh i yestestvennykh nauk, 1958, Nr 1, pp 116-120 (USSR)

ABSTRACT: In round pipes of plexiglass (l = 1000 mm, $\phi$ 20 mm ) and in channels of rectangular cross section ( l = 120 mm, S = 19 X 3.8 $mm^2$) with walls of glass the author photographed the propagation of a shock explosion. He especially used channels with ribbed walls and orifices ( $\phi$ 5 mm and 17 mm). The author obtained very good images, the evaluation of which permits numerous conclusions, e.g. for the impingement against a single rib the explosion partly is reflected; that involves a slower course of the whole process. At the one hand the orifices act accelerating, at the other hand braking because of the reflection; for 10 mm orifices the acceleration is stronger than the braking action. The author thanks the corresponding member of the Academy of Sciences A.S. Predvoditelev for giving the problem.
There are 5 figures and 2 Soviet references.

Card 1/2

On the Propagation of Shock Explosions in Channels With Uneven Walls SOV/55-58-1-14/33

ASSOCIATION: Kafedra molekulyarnoy fiziki (Chair of Molecular Physics)

SUBMITTED: February 22, 1957

Card 2/2

SOV/76-32-8-23/37

AUTHOR: Leonas, V. B.

TITLE: Investigation of the Formation and Propagation of Spherical Shock Explosions (Izucheniye obrazovaniya i rasprostraneniya sfericheskikh udarnykh razryvov)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 8, pp. 1869-1873 (USSR)

ABSTRACT: The formation of shock explosions in the case of an accelerated travel of the piston in the tube was investigated by Hugoniot (Gyugonic) (Ref 1). The results of these investigations can, however, not be applied without difficulties in the case of spherically symmetric motions. In other papers it was found that prior to the expansion of the gas ball a shock explosion must take place; it has, however, not been explained when and where it occurs. The present investigations were carried out in a spherical steel chamber (with a glass window) and the apparatus according to Maksutov IAB 451 was used for photographing. Investigations made in a propane-oxygen mixture showed that the propagation of the flames does not take place uniformly, as was also observed by other authors. L. D. Landau

Card 1/2.

(Ref 4) explained this fact by an "autoturbification" formed by local differences in concentration, temperature etc., and which is too small to initiate an acceleration causing a detonation. To reach an intensification an accelerator was used in the present case, so that detonations could be obtained. This accelerator consists of two hollow, perforated, metallic hemispheres through which the flames pass; on this occasion they are accelerated as required for the detonation. In investigating the process a strange phenomenon was observed, which is explained. Finally the author expresses his gratitude to Professor A. S. Predvoditelev. There are 4 figures and 5 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: March 23, 1957

82899
S/120/60/000/02/030/052
E032/E414

24.6000

AUTHORS: Leonas, V.B. and Rubtsov, V.K.

TITLE: A Selector for Studying Molecular Velocities

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, Nr 2, pp 115-118 (USSR)

ABSTRACT: The present instrument is based on the so-called "time of flight" method, in which a continuous molecular beam is produced and is subsequently divided into groups of particles with given time of flight over a defined distance. The basic element of the selector is a rotor consisting of a rotating shaft with two discs attached to it. The discs have narrow slots cut in them. If only a single disc is used, a modulated beam is produced. The latter is very convenient because it does not involve the use of d.c. amplifiers. Fig 2 shows an oscillogram obtained for a beam modulated by a single disc. The pulses on the oscillogram correspond to the arrival at the detector of successive groups of molecules. Fig 3 shows a selector consisting of a shaft with two discs, 1 and 4, at a distance of 100 mm from each other. The discs are 50 mm in diameter.

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82899
S/120/60/000/02/030/052
E032/E414

A Selector for Studying Molecular Velocities

9 and 10 constitute an arrangement for counting the number of revolutions and 8 is the stator. The slots in the two discs are displaced relative to each other. At a given angular velocity, only those particles will pass through the system for which the time of flight between the two discs is equal to the time taken by the discs to rotate through an angle equal to the angle between the corresponding slots. The slots were made 0.3 mm wide and 4 mm long. The displacement between them was 4 mm. The error associated with the finite width of the slots was $\pm$ 7.5%. Table 1 gives some of the working characteristics of the selector (column 1, angular velocity in rps; column 2, time of flight in m/sec; column 3, measured velocity in km/sec; column 4, velocity of slow particles passing through the second slot in km/sec). Details are given of the method of winding of the stator and it is claimed that the machine will work in a vacuum of $10^{-5}$ mm Hg without noticeable out-gassing. There are 4

C.

Card 2/3

Leonas, V. B.

"Experimental Investigation of Heat Transfer under the Free Molecular Flow Conditions"

Report presented at the Conference on Heat and Transfer. Minsk, USSR, 5-10 June 61

S/120/62/000/003/031/048
E032/E114

AUTHOR: Leonas, V.B.

TITLE: Detection of neutral molecular beams

PERIODICAL: Pribory i tekhnika eksperimenta, no.3, 1962, 127-129

TEXT: A description is given of an ionization detector of molecular beams. It was designed for experiments in which it was necessary to record accurately the instant at which the beam entered the detector. The detector is illustrated in Fig.1. The electrode system 1, 2, 3 is an electron gun of conventional design producing a narrow beam of electrons of rectangular cross-section. The cathode was oxide coated and indirectly heated. The electron current density was 150 mA/cm$^2$ and the corresponding ionization probability was 0.1%, so that one molecule in a thousand was ionized. Since d.c. amplification of the ion currents is difficult the molecular beam was modulated by the chopper described by the present author and V.K. Rubtsov (PTE, no.2, 1960, 115). By using a synchronous detector with a phase shifter it was possible to detect signals below the noise level and to measure the particle velocities by determining the time of

Card 1/ 2

Detection of neutral molecular beams

flight along a known distance. A block diagram of the entire device is shown in Fig.2, in which: 1 - molecular beam source; 2 - photomultiplier and lamp; 3 - velocity selector (beam chopper); 4 - ionization detector; 5 - stator coils of the selector; 6 - measuring apparatus; 7 - automatic frequency tuning for the selector; 8 - oscilloscope for visual control of frequency and tuning.
Key to Fig.2. a - resonance amplifier. b - phase shifter. c - synchronous detector. d - resonance amplifier. e - recording device. f - relay. g - power amplifier. h - synchronous detector. i - master oscillator.
The system may be used to record $10^{10}$ molecules/sec, which is equivalent to $10^5$ molecules per pulse or to a change of pressure of $10^{-10}$ in a static pressure of $10^{-5}$ mm Hg. There are three figures.

ASSOCIATION: Fizicheskiy fakul'tet MGU
(Physics Department, Moscow State University)

SUBMITTED: September 5, 1961

Card 2/2





3,5710

AUTHOR: Leonas, V.B.

TITLE: Reflection of a molecular stream from a hard wall

PERIODICAL: Geomagnetizm i Aeronomiya, v.2, no.1, 1962, 180-181

TEXT: The density distribution in the atmosphere can be found from observation on the changes in satellite orbits with time. One of the main factors entering into the equations is the force of the aerodynamic resistance of the satellite. To determine this factor the coefficients of normal ($\sigma_N$) and tangential ($\sigma_T$) momentum transfer have to be known. Until now only idealized schemes of totally diffusive ($\sigma_N = \sigma_T = 1$) and totally specular ($\sigma_N = \sigma_T = 0$) reflection were used. An apparatus was built to measure $\sigma_N$ and $\sigma_T$. Collimated beams of $N_2$, Ar, $CO_2$ and other molecules with velocities in the range 1.5-2 km/sec were produced. The detector had an angular resolution of 5 degrees and its position could be fixed with an accuracy of 1°. The angular dis-

LEONAS, V.B. (Moskva)

Interaction between a molecular flow and a wall. PMTF no.6: 39-44 N-D '62. (MIRA 16:6)

1. Moskovskiy gosudarstvennyy universitet.
(Molecular beams) (Aerodynamics)

LEONAS, V.B.

Detection of neutral molecular beams. Prib. i tekh. eksp. 7 no.3:127-129 My-Je '62. (MIRA 16:7)

1. Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta.
(Molecular beams)

L 15730-63 EPF(c)/EWT(l)/EWP(q)/EWT(m)/BDS AFFTC/ASD Pr-4 JD
S/0124/63/000/005/B037/B037

ACCESSION NR: AR3002669

63
60

SOURCE: Rzh. Mekhanika, Abs. 5B184

AUTHOR: Leonas, V.B.

TITLE: Experimental study of gas escape in vacuum

CITED SOURCE: Tr. Odessk. un-ta. Ser. fiz. n., v. 152, no. 8, 1962, 102-106

TOPIC TAGS: molecular beam, gas, escape, ionization, hydrogen, argon, nitrogen supersonic, jet, nozzle, convergent-divergent nozzle

TRANSLATION: The molecular beam obtained upon the discharge of gas from a nozzle in a vacuum was studied. The gas was sent through a conical convergent-divergent nozzle with a critical section diameter of 0.6 mm. A beam was separated from the jet through the use of a conical shaping aperture. The aperture diameter was 0.6 mm and the distance between the nozzle opening and the aperture was 2 mm. The beam passes through a collimating aperture of 1.5 mm diameter, separated from the shaping aperture by 20 mm. A high vacuum is maintained in the chambers between the apertures. The beam is detected by the ...ce

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L 15730-63
ACCESSION NR: AR3002669

3

of an ionization detector. The molecules of the beam are ionized by electron collisions and the ion current, which is proportional to the beam intensity, is measured.

The intensity of the molecular beams of different gases was measured: hydrogen, argon, nitrogen and their mixtures at various pressures and concentrations. It was discovered that the original concentrations in the mixture are not conserved--a concentration of the heavier components occurs. This concentration is the result of the spatial separation of the components in the supersonic jet and, possibly, partially in the beam. The distribution of molecules according to velocity was also studied. An unequal acceleration of the molecules of the heavy components was observed. Yu.R.

DATE ACQ: 14Jun63 SUB CODE: PH ENCL: 00

Card 2/2

LEONAS, V. B.

ACCESSION NR: AP3000811 S/0203/63/003/003/0574/0575

AUTHOR: Leonas, V. B.

TITLE: On one possibility of measuring the temperature in the upper atmospheric layers

SOURCE: Geomagnetizm i aeronomiya, v. 3, no. 3, 1963, 574-575

TOPIC TAGS: upper atmosphere, direct temperature-measurement method, use of satellites

ABSTRACT: A method has been developed for measuring the temperature of the upper atmosphere by means of satellites. The method is based on the analysis of the transit-time distribution of particles in a molecular beam. In order to obtain an expression for a velocity distribution when the beam intensity is assumed to be modulated by rectangular pulses, an analysis was made for the case when the beam is constant in regard to time and uniform in regard to its mass. The normalized function of the velocity distribution f(v) is found to be f(v) is approximately equal to it where i is an ion current

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ACCESSION NR: AP3000811

and t is an arbitrary moment of time. In the practical application of this method, the beam caused by the motion of a satellite passes to a receiver through a chopper disk, which forms short rectangular pulses. Distortions of these pulses caused by the difference in particle velocities, as well as the particle velocities themselves, are determined. After the separation of the velocity component caused by thermal motion of the unperturbed medium from the component due to satellite motion, the temperature is determined on the basis of a comparison of the thermal component with the Maxwell velocity distribution of particles. It is noted that in this method measurements are practically not affected by degassing and reflection from the equipment of particles passed through the disk. The method is limited by the effectiveness of registering but not by the altitude; at an effectiveness of 10 sup -3 it could be used up to 400 km. Orig. art. has: 2 figures.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet, Fizicheskiy fakul'tet (Moscow State University, Physics Department)

Card 2/3

BELYAYEV, Yu.N.; LEONAS, V.B.

Generation of intensive molecular beams. Vest. Mosk. un. Ser. 3:Fiz., astron. 18 no.5:34-42 S-O '63. (MIRA 16:10)

1. Kafedra molekulyarnoy fiziki Moskovskogo gosudarstvennogo universiteta.

ACCESSION NR: AP4017158 S/0053/64/082/002/0287/0323

AUTHOR: Leonas, V. B.

TITLE: Present status and some new results in the molecular beam method

SOURCE: Uspekhi fizicheskikh nauk, v. 82, no. 2, 1964, 287-323

TOPIC TAGS: molecular beam, molecular beam method, intense molecular beam, molecular beam production, molecular beam registration, oven method, sputtering method, gas dynamic beam source, charge exchange beam source, sputtering beam source, molecular actapult, molecular beam elastic scattering, escape in vacuum, chemical physics, molecular physics

ABSTRACT: Recent progress in both the production of more intense molecular beams and in more effective registration of the signal obtained by its means is reviewed. Current applications of the meth-

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ACCESSION NR: AP4017158

od of molecular beams to specific problems in molecular and chemical physics are listed. Some theoretical considerations involved in determining the elastic scattering interaction potential from data are briefly treated. The techniques discussed are the oven method of molecular beam production, gas-dynamic sources, charge-exchange sources, sputtering sources, molecular catapults, pulsed sources, and means for recording and selecting molecular beams. The described molecular-beam applications include elastic scattering of molecular beams and study of internuclear forces, chemical uses of the molecular beam method, the use of molecular beams to study phenomena accompanying escape in vacuum, and interaction between beam molecules and solid surfaces. Laser and rocket applications are mentioned. Orig. art. has: 18 figures, 10 formulas, and 3 tables.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 19Mar64 ENCL: 00

SUB CODE: PH, CH NO REF SOV: 040 OTHER: 135

Card 2/2

LEONAS, V.B. (Moskva)

Energy exchange in collisions of hard-walled particles.
PMTF no. 6:124-127 N-D '63. (MIRA 17:7)

KAMNEV, A. B.; LEONAS, V. B.

"On the determination method of the kinetic properties of high-temperature gases."

report submitted for 2nd All-Union Conf on Heat & Mass Transfer, Minsk, 4-12 May 1964.

Moscow State Univ.

L 53646-65 EWT(1) IJP(c)

ACCESSION NR: AP5013375 UR/0207/65/000/002/0084/0086

AUTHOR: Leonas, V. B. (Moscow)

TITLE: Study of the energy exchange in collisions of molecular flux with a surface

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 2, 1965, 84-86

TOPIC TAGS: molecular beam, molecular interaction, surface property

ABSTRACT: Apparatus is briefly described and some results are given for a study of the interaction of molecular bemas with various metallic surfaces. Detailed descriptions of the experimental apparatus, the beam velocity selector, and the detector system are given in previous articles (V. B. Leonas, Izucheniye vzaimodeystviya molekulyarnogo puchka so stenkoy. PMTF, 1962, No. 6, p. 39; V. B. Leonas and V. K. Rubtsov, Selektor dlya issledovaniya skorostey molekul. Pribory i tekhn. eksperimen., 1960, No. 2, p. 115; V. B. Leonas, Detektirovaniye puchkov neytral'nykh molekul. Pribory i tekhn. eksperimen., 1962, No. 3, p. 127). The method of determining the molecular velocities by measuring the flight times for various known distances is discussed. The selected paths are such that the velocities of the incident and reflected molecules and the capture time of the molecules at the surface can be determined. Some results are given for molecular beams

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L 53646-65
ACCESSION NR: AP5013375

($Ar$, $CO_2$) incident on metallic surfaces (Cu, Fe, Ta). It was found that for all combinations of molecular beams and surfaces the velocity of the reflected beam corresponded to the mean velocity of the molecules at the temperature of the surface for all surface temperatures used in the range 300-1100K. The capture times decreased with increasing surface temperature, depended on both the beam and the surface compositions, and were all in the range of 20-50 $\mu$ sec. It was found, however, that the adsorption energy was practically independent of temperature and is about 1.8 eV. The author thanks N. V. Kamyshov who took part in the completion of the work. Orig. art. has: 1 diagram.

ASSOCIATION: none

SUBMITTED: 20May63 ENCL: 00 SUB CODE: NP

NO REF SOV: 004 OTHER: 002

Card 2/2

L 63203-65 EWT(1) IJP(c)

ACCESSION NR: AP5018196 UR/0207/65/000/003/0071/0074

AUTHOR: Leonas, V. B. (Moscow) 55

TITLE: Energy exchange during collision of molecules with a solid wall 21,55

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 3, 1965, 71-74

TOPIC TAGS: energy transfer, elastic scattering, Lennard Jones potential, molecular collision mechanism

ABSTRACT: The energy exchange and momentum loss during the collision of a high speed, vibrationally excited molecule with a linear atomic chain were investigated in some detail. The interaction potential between the molecular atoms is described by the Lennard-Jones potential and the wall atoms connected in an elastic chain (see Fig. 1 on the Enclosure) by $V = K(R_i - R_{i+1})$, where K is the elastic constant of the lattice. The collisional energy was assumed to vary between 0.1 to 50 ev. The initial vibrational energy was assumed to be $E_0 = 0.22\,\varepsilon_1$, $0.085\,\varepsilon_1$, and $0.018\,\varepsilon_1$ ($\varepsilon_1$ - molecular dissociation energy). Velocity versus time curves were obtained to describe the collision process for various initial molecule-atomic chain distances. With respect to complamentary vibrational excitation, the transition from

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L 63203-65

ACCESSION NR: AP5018196

4

compression to tension appears to be the most effective collisional state, the opposite being true for the reverse transition. From this data three transfer coefficient curves were calculated: translational $\alpha_1$, total energy $\alpha_2$, and vibrational energy gain $E_1' - E_0'$ as functions of $E_0$. These curves show that the presence of vibrational degrees of freedom influences only slightly the momentum exchange during collisions (see Fig. 2 on the Enclosure). Thus, during the flow of rarefied gas over a body at high speed, the excitation in the vibrational degrees of freedom reduces the heat transfer to the body by only 10%. "In conclusion the author thanks Yu. N. Belyayev for taking part in these calculations, and A. I. Osipov for his valuable advice." Orig. art. has: 3 figures and 2 formulas.

55

ASSOCIATION: none

SUBMITTED: 18Apr64 ENCL: 01 SUB CODE: NP, ME

NO REF SOV: 002 OTHER: 002

Card 2/3

L 63203-65

ACCESSION NR: AP5018196 ENCLOSURE: 01

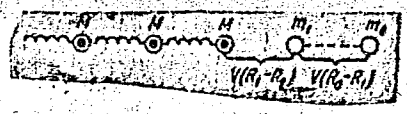

Fig. 1.

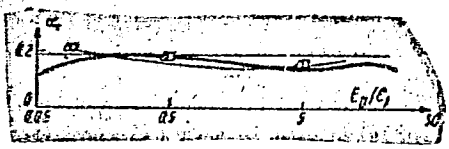

Fig. 2.

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L 01475-66 EWT(1)

ACCESSION NR: AP5015419 UR/0020/65/162/004/0798/0800

AUTHOR: Kamnev, A. B.; Leonas, V. B.

TITLE: Potentials of the repulsive interaction between atoms of the inert gases

SOURCE: AN SSSR. Doklady, v. 162, no. 4, 1965, 798-800

TOPIC TAGS: particle interaction, inert gas, elastic scattering

ABSTRACT: The forces of interaction between atoms and molecules are of interest in studying various properties of matter, investigations of the penetration of matter by fast particles, etc. The authors study elastic scattering using the experimental equipment shown schematically in fig. 1 of the Enclosure. A standard MS-1 mass-spectrograph was used as the monochromatic source. The ion beam was converted to a neutral beam by charge exchange. The particle energy was 0.6-4 kev. The target was a small cavity with narrow slots filled with a chemically pure gas at known pressure. Potential parameters were determined for the following systems: He-He, Ne-Ne, Ar-Ar, He-Ar, He-Ne and Ne-Ar. The potentials for these systems and the range Δr in which they hold are given in table 1 of the Enclosure. The results show good agreement with the data of other authors (see fig. 2 of the Enclosure). "In

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L 01475-66

ACCESSION NR: AP5015419

conclusion, the authors are grateful to V. A. Popov who participated in the work and to O. B. Firsov for discussing the results." Orig. art. has: 2 figures, 1 table.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 03Dec64 ENCL: 00 SUB CODE: NP

NO REF SOV: 002 OTHER: 004

Card 2/5

L 01475-66

ACCESSION NR: AP5015419 ENCLOSURE: 01

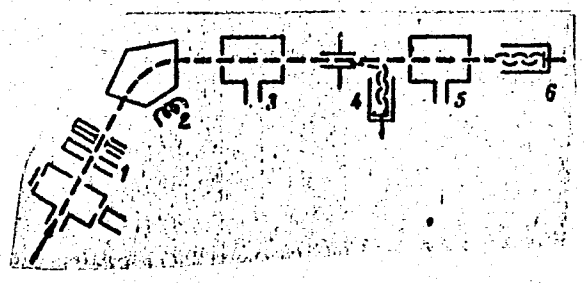


Fig. 1. Block diagram of the experimental equipment: 1--ion source; 2--magnetic analyzer; 3--charge exchange chamber; 4--monitor and condenser for deflecting charged ions; 5--scattering chamber; 6--receiver and recorders.

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L 01475-66

ACCESSION NR: AP5015419 ENCLOSURE: 02

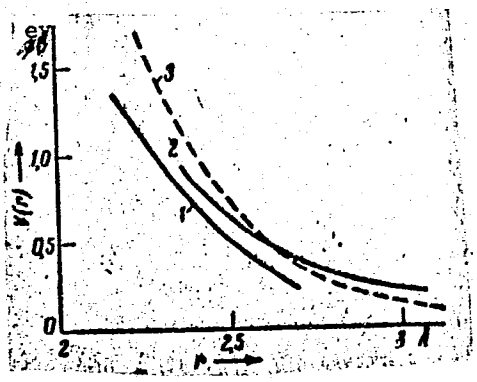


Fig. 2. 1--data of J. Amdur, *Planetary Space Sci.*, 3, 228, 1961; 2--data of the experiment conducted in this paper; 3--data of A. A. Abrahamson, *Phys. Rev.*, 130, 693, 1963.

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L 01475-66

ACCESSION NR: AP5015419 ENCLOSURE: 03

Table 1

| System | K | σ | Δr, Å |
|---|---|---|---|
| He-He | 2.8 | 3.9 | 0.87-1.27 |
| Ne-Ne | 78 | 7.65 | 1.7 -2.18 |
| Ar-Ar | 171 | 6.06 | 2.26-3.14 |
| He-Ar | 22.6 | 5.15 | 1.63-2.06 |
| He-Ne | 10.3 | 5.61 | 1.3 -1.65 |
| Ne-Ar | 99.5 | 6.56 | 1.93-2.49 |

Card 5/5

L 14075-66 EWT(1)/EWT(m)/EWP(t)/EWP(b) IJP(c) JD

ACC NR: AP6003241 SOURCE CODE: UR/0020/65/165/006/1273/1274

AUTHOR: Kamnev, A. B.; Leonas, V. B.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: Potentials of repulsive interaction between atoms of the inert gases

SOURCE: AN SSSR. Doklady, v. 165, no. 6, 1965, 1273-1274

TOPIC TAGS: inert gas, particle interaction, scattering cross section, atomic physics

ABSTRACT: The authors use data on the scattering of fast beams of neutral atoms for determining the constants $K$ and $s$ in the formula $V(\gamma) = K/\gamma^s$ for repulsive interaction between heavy inert gases (Kr, Xe) as well as for combinations of these gases with the lighter members of the series. Formulas are given for determining the potentials of interaction for mixed gases. Comparison shows satisfactory agreement between experimental and theoretical data for all systems of gases. The energies of interaction coincide with an accuracy of 15-20% for all systems except

UDC: 539.186.3

Card 1/2

L 14075-66

ACC NR: AP6003241

Ne-Kr and Ar-Kr where coincidence is somewhat poorer. This is apparently due to the fact that an increase in the curvature of the potential $s$ reduces accuracy in determining the value of the other parameter $K$ since the latter is proportional to the experimentally determined value of the effective scattering cross section. A comparison of the potential curves for the Xe-Xe and Kr-Kr systems with experimental data shows a noticeable divergence for the first case and satisfactory agreement for the second. The authors are grateful to Professor O. B. Firsov for discussing the results. Orig. art. has: 1 table, 2 formulas.

SUB CODE: 20/ SUBM DATE: 26Apr65/ ORIG REF: 001/ OTH REF: 004

QC

Card 2/2

L 23490-66 EWT(l)/EWT(m)/EWP(t) IJP(c) JD

ACC NR: AP6007087 UR/0057/66/036/002/0353/0357

AUTHOR: Belyayev, Yu.N.; Leonas, V.B.

ORG: Moscow State University im. M.V.Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: Intermolecular force between oxygen and nitrogen in the repulsive region

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 2, 1966, 353-357

TOPIC TAGS: nitrogen, oxygen, argon, molecular interaction, elastic scattering, intermolecular force, gas relaxation, vibration relaxation

ABSTRACT: Experimental data on the total cross sections for elastic scattering of 0.6 to 4 keV oxygen and nitrogen molecules by nitrogen and oxygen molecules and argon atoms were employed to calculate the $N_2$- $N_2$, $N_2$- Ar, $N_2$- $O_2$, $O_2$- $O_2$, and $O_2$- Ar interaction potentials. The experimental techniques (and presumably the data themselves) are discussed elsewhere by A.B.Kamnev and V.B.Leonas (DAN SSSR, 162, 788, 1965). The interaction potentials were assumed to have the form $K/r^n$, where r is the distance between the interacting molecules, and the parameters K and n for the different potentials were calculated from the energy dependences of the corresponding cross sections. The $N_2$- $O_2$ potential was found to be equal, within the experimental error, to the geometric mean of the $N_2$- $N_2$ and $O_2$- $O_2$ potentials. The fact that the true potentials are not spherically symmetric is discussed, and it is concluded that attempts to derive the

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L 23490-66

ACC NR: AP6007087

2

parameters of potentials that are not spherically symmetric from scattering data are of doubtful value. The $N_2$- $N_2$, $N_2$- $O_2$, and $O_2$- $O_2$ potentials were calculated from the $N_2$- Ar and $O_2$- Ar scattering data by the indirect procedure of I.Amdur, E.A.Mason, and J.E.Jordan (J.Chem. Phys., 27, 577, 1957), and the results were found to be in good agreement with the potentials derived directly from the $N_2$- $N_2$, $N_2$- $O_2$ and $O_2$- $O_2$ scattering data. Interaction potentials calculated by the semi-empirical method of J.T.Vanderslice et al. (J.Chem. Phys. 30, 129, 1959; 32, 515, 1960) were not in agreement with those derived directly from the scattering data, but satisfactory agreement was obtained when the improved technique of W.E.Meador (NASA Techn. Rep., R = 68, 1960) was employed. Interaction potentials derived with the aid of the theory of vibrational relaxation of gas molecules by N.A.Generalov and S.A.Losev (DAN SSSR, 148, 552, 1963; Izv. AN SSSR, ser. fiz., 27, 1110, 1963) were not in agreement with those obtained from the scattering data; this discrepancy is ascribed to inadequacy of the relaxation theory. The authors thank A.B.Kamnev and A.V.Sermyagin for participating in the work. Orig. art. has: 1 formula, 3 figures, and 1 table.

SUB CODE: 20, 07 SUBM DATE: 07Jun65/ ORIG REF: 002/ OTH REF: 006

Card 2/2 fw

L 25998-66 EWT(1) IJP(c)

ACC NR: AP6013523 SOURCE CODE: UR/0120/66/000/002/0182/0186

AUTHOR: Kamnev, A. B.; Leonas, V. B.; Popov, V. G.

ORG: Physics Department, MGU (Fizicheskiy fakul'tet MGU)

TITLE: A device for producing fast beams of atoms and molecules

SOURCE: Pribory i tekhnika eksperimenta, no. 2, 1966, 182-186

TOPIC TAGS: molecular beam, particle beam, magnetic analyzer, ion source, charge exchange, elastic scattering, particle interaction

ABSTRACT: A device is described for analyzing interatomic forces in the interaction energy range of approximately one electron-volt by measuring scattering of high-energy ($10^2$-$10^3$ ev) neutral beams through small angles. A block diagram of the experimental set is shown in the figure. Positive ions from source *1* are accelerated and directed into the magnetic analyzer chamber. An ion beam of fixed mass and energy is filtered out by magnetic analyzer *2* and sent to charge-exchange chamber *3*. The beam is collimated and ions are eliminated by deflecting condenser *4*. The neutral beam then passes into scattering chamber *5* and the change in intensity due to passage through the target is registered by detector *6*. The proposed installation is based on elastic scattering of fast beams of neutral particles in a gas for determining the potentials of interatomic and intermolecular interaction. The individual components of the in-

UDC: 539.188.539.198

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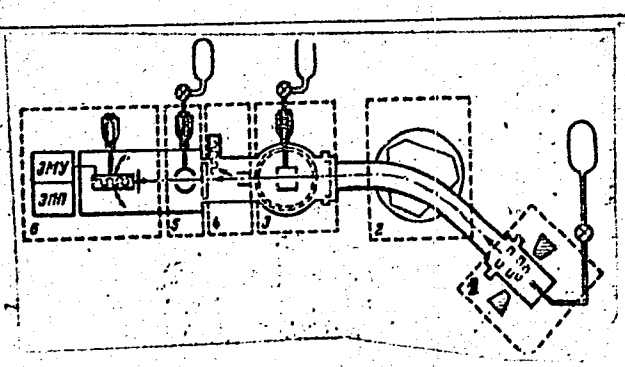
L 25998-66

ACC NR: AP6013523




stallation are each discussed in detail. The device was used for studying elastic and inelastic scattering of neutral beams at interaction energies ranging from 0.1 to 100 ev. The proposed installation may also be used for studying scattering of metal and chemically unstable atoms. The authors are sincerely grateful to A. I. Shal'nikov for his interest in the work and useful advice and to L. P. Khavkin for consultation. [14]
Orig. art. has: 4 figures, and 1 formula.

SUB CODE: 20/ SUBM DATE: 02Mar65/ ORIG REF: 004/ OTH REF: 005
ATD PRESS: 4255

Card 2/2

L 10717-66 EWT(1) IJP(c) JAJ

ACC NR: AP6031584 SOURCE CODE: UR/0386/66/004/004/0134/0138

AUTHOR: Belyayev, Yu. N.; Leonas, V. B. 4/2 B

ORG: Mechanics Research Institute at the Moscow State University (Nauchno-issledovatel'skiy institut mekhaniki pri MGU)

TITLE: Features of scattering of fast beams of H, N. and O atoms in molecular gases ($N_2$, $O_2$)

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 4, no. 4, 1966, 134-138

TOPIC TAGS: atom scattering, molecular interaction, scattering cross section, hydrogen, nitrogen, oxygen

ABSTRACT: The purpose of the investigation was to determine the interaction potential energy needed for a theoretical calculation of the elastic and inelastic processes accompanying atom-molecule collisions. This was done by scattering fast beams from gas targets, using the experimental setup and the measurement procedure described earlier by one of the authors (with A. B. Kamnev et al, PTE, no 2, 182, 1966). Measurements of the total scattering cross sections were made with the aid of beams with energies from 0.6 to 4 kev, using three different detector angular apertures $\theta_0$. The authors measured the absolute values of the total cross sections for elastic scattering of H, N, and O atoms by $O_2$ and $N_2$ molecules as functions of the energy. From these data they obtained the parameters of the effective spherically-symmetrical

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ACC NR: AP6031584

potentials describing the interaction of the investigated systems in the energy region ~1 kev. Singularities were observed in the energy dependence of the cross sections $Q(\theta_0)$ for the scattering of atoms with unclosed electron shells by molecules. Using the $O-N_2$ system as an example, an attempt is made to explain the observed scattering singularities and to estimate the probability of nonadiabatic electronic transition. It is decided that the observed singularities reflect sharp changes in the character of the interaction of atom-molecule distances. Such changes can be the consequence of the crossing of the levels of the electron energy for symmetrical configurations of three identical atoms. Orig. art. has: 1 figure and 1 table.

SUB CODE: 20/ SUBM DATE: 02Jun66/ ORIG REF: 004/ OTH REF: 001

Card 2/2

ACC NR: AP6033958 SOURCE CODE: UR/0294/66/004/005/0732/0733

AUTHOR: Belyayev, Yu. N.; Leonas, V. B.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: Kinetic coefficients of molecular oxygen and nitrogen at high temperatures

SOURCE: Teplofizika vysokikh temperatur, v. 4, no. 5, 1966, 732-733

TOPIC TAGS: high temperature interaction, molecular oxygen, molecular nitrogen, diffusion coefficient, viscosity coefficient , intermolecular force, molecular interaction , oxygen, nitrogen

ABSTRACT: Viscosity, self-diffusion (at constant density $p = 10^{-4}$ g/cm$^2$), and counterdiffssion (at 1 atm) coefficients have been calculated for molecular oxygen and nitrogen at 2000—15000K (see Table 1). The calculation was performed using previously derived formulas and the parameters of the effective spherically symmetrical

Card 1/3 UDC: 539.196.3:546.17+546.21

Table 1.

| T° K | Nitrogen | | Oxygen | | $D_{12}$, $cm^2/sec$ |
|---|---|---|---|---|---|
| | $\eta \cdot 10^4$, g/cm sec | D, $cm^2/sec$ | $\eta \cdot 10^4$, g/cm sec | D, $cm^2/sec$ | |
| 2000 | 6,83 | 9,89 | 6,9 | 10,16 | 5,5 |
| 3000 | 9,33 | 13,51 | 9,4 | 13,84 | 11,34 |
| 4000 | 11,68 | 16,92 | 11,9 | 17,52 | 19,07 |
| 5000 | 13,88 | 20,10 | 14,6 | 21,50 | 28,50 |
| 6000 | 16,03 | 23,20 | 16,95 | 24,95 | 39,40 |
| 7500 | 19,0 | 27,50 | 19,93 | 29,32 | 58,90 |
| 10000 | 23,7 | 34,30 | 25,2 | 37,10 | 98,50 |
| 12500 | 28,2 | 40,80 | 30,5 | 44,90 | 144,6 |
| 15000 | 32,6 | 47,10 | 35,1 | 61,70 | 203,7 |

Table 2. Parameters of intermolecular potential energy of interaction of oxygen and nitrogen $V(r) = K/r^n$ ev

| System | K | n | r, A |
|---|---|---|---|
| $N_2$—$N_2$ | 550 | 7.4 | 2.34—3.05 |
| $N_2$—$O_2$ | 330 | 6.8 | 2.32—3.05 |
| $O_2$—$O_2$ | 240 | 6.3 | 2.32—3.15 |



APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R000929220015-1"

ACC NR: AP6033958

potential energy ($V(r) = K/r^n$) of intermolecular interaction (see Table 2). Orig. art. has: 2 tables. [WA-68]

SUB CODE: 20 / SUBM DATE: 07Jun65/ ORIG REF: 002/ OTH REF: 002/

Card 3/3

ACC NR: AP6034751 SOURCE CODE: UR/0020/66/170/005/1039/1040

AUTHOR: Belyayev, Yu. N.; Leonas, V. B.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: Short-range forces of intermolecular interaction of oxygen and nitrogen

SOURCE: AN SSSR. Doklady, v. 170, no. 5, 1966, 1039-1040

TOPIC TAGS: intermolecular force, oxygen, nitrogen, argon, molecular interaction, elastic scattering, scattering cross section, relaxation process

ABSTRACT: In view of recent interest in the study of elastic scattering of nitrogen and oxygen molecules in their own gas and by atoms of noble gases, the authors determine the parameters K and s of the intermolecular-interaction potential function $V(r) = K/r^s$ from the energy dependence of the total effective cross section of a beam of fast neutral molecules of nitrogen and oxygen (E = 0.6 - 4 kev) in oxygen, nitrogen, and argon. The principle of the method and the experimental setup are described elsewhere (DAN v. 162, 798, 1965). A table listing these parameters and a plot of the resultant potential curve for the $O_2$ - $O_2$ interaction are presented. The latter is compared with potential curves obtained by others. The curve obtained from data on the relaxation of the molecule vibrations in the gas agrees poorly with the present results, in view of deficiencies in the present theory of vibrational relaxation. On the other hand, comparison with refined calculations on the basis of a semi-empirical

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UDC: 539.196.2

ACC NR: AP6034751

method produced better agreement. The authors thank A. B. Kamnev for taking part in the research. This report was presented by Academician G. I. Petrov 22 April 1965. Orig. art. has: 1 figure, 1 formula, and 1 table.

SUB CODE: 20/ SUBM DATE: 14Apr65/ ORIG REF: 001/ OTH REF: 004

Card 2/2

S/271/63/000/003/049/049
A060/A126

AUTHORS: Motskus, I.B., Shal'tyanis, V.R., Leonas, V.L.

TITLE: Optimization problems in the task of raising the throughput capacity of power distribution grids

PERIODICAL: Referativnyy zhurnal, Avtomatika, telemekhanika i vychislitel'naya tekhnika, no. 3, 1963, 84, abstract 3B498 (Dokl. na 4-y Mezhvuz. konferentsii po primeneniyu fiz. i matem. modelirovaniya v razlichn.. otraslyakh tekhn. Sb. 2, Moscow, 1962, 73 - 82)

TEXT: As an example of a problem in optimal design of industrial systems the authors analyze the problem of finding the values of the principal parameters of electrical distribution grids, corresponding to the estimated minimum losses. The basic characteristic traits of contemporary production systems are enumerated: Multidimensionality, connectivity, nonlinearity, balancing of the elements, dynamicity. It is concluded that the problem of optimal synthesis of such systems leads usually to multiextremal problems. The mathematical complexity of the solution of such problems is emphasized. To simplify their solution

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Optimalization problems in the task of raising .... S/271/63/000/003/049/049
A060/A126

in the design of systems it is proposed to use separate optimization and the limits of its expedient application are estimated. A method is set forth of constructing an algorithm for finding the optimal configuration of a construction and increasing the throughput capacity of a group of feeders corresponding to the least losses. The algorithm is realized on the computer БЭСМ-2 (BESM-2). The organization of the program is described in detail. The results of calculations are discussed. It is noted that in order to solve problems of optimal design high-speed computers are required possessing a large-volume operating memory and well-developed possibilities of output of results. There are 4 figures and 1 reference.

V. M.

[Abstracter's note: Complete translation]

Card 2/2

LEONAS, V.L. (Kaunas); MOTSKUS, I.B. [Mockus, I.] (Kaunas)

Method for sequential search for the optimization of industrial systems and networks. Izv. AN SSSR. Energ. i transp. no.1:18-25 Ja-F '65. (MIRA 18:4)

L 05985-67 EWI(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l) JT

ACC NR: AT6018278 SOURCE CODE: UR/3192/65/000/010/0033/0042

AUTHOR: Leonas, V. L.; Motskus, I. B.

22
B+1

ORG: none

14

TITLE: Sequential search method used for optimizing closed-loop systems and networks

SOURCE: AN LatSSR. Institut elektroniki i vychislitel'noy tekhniki. Avtomatika i vychislitel'naya tekhnika, no. 10, 1965, 33-42

TOPIC TAGS: optimization, graph theory

ABSTRACT: The problem of optimization (cost minimization) of an electric, transportation, gas-distribution, heat-distribution, or other industrial systems is represented as a directed graph; the costs are represented by nonlinear functions of graph branches. If the cost function is convex, the methods of linear and convex programing are applicable. If the cost function is not necessarily convex, an approximate method of sequential search is recommended. The well-known

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techniques of exploratory search with graph "trees" are described; a global minimum of each variable is found. If the cost function represents a sum or a product of individual functions that depend on one variable, a global minimum is reached; in other cases, the minimum attained still lies pretty close to the global minimum. Orig. art. has: 4 figures, 13 formulas, and 1 table.

SUB CODE: 12, 09 / SUBM DATE: none / ORIG REF: 008 / OTH REF: 001

Card 2/2

LEONCHENKOVA, Ye.T.

Fluorescent analysis of flotation waste waters. Obog. rud 5 no.1:24-25 '60. (MIRA 14:8)
(Industrial wastes--Analysis)
(Fluorescence)



MASLENITSKIY, N.N.; LEONCHENKOVA, Ye.T.

Interrelation of nickel and pyrrhotite in sulfide copper-nickel ores. Obog. rud 7 no.2:21-23 '62. (MIRA 16:4)
(Pyrrhotite--Analysis) (Nickel--Analysis)

LEONCHEVA, N.V.

Changes of the karst and tree vegetation of the Chatyr-Dag region in the postglacial period. Trudy Inst.min.resur. AN URSR no.2: 74-82 '60. (MIRA 15:5)
(Chatyr-Dag--Karst) (Chatyr-Dag--Trees)

DIKKER, G.L., YEREMENKO, F.M., LEONCHIK, B.I., spets.red.; VASIL'YEVA, G.N., red.; YAROV, E.M., tekhn.red.

[Feeding tobacco into cigarette machines by pneumatic means] Pneuvmaticheskoe pitanie tabakom sigaretnykh mashin. Moskva, Pishchepromizdat, 1956. 38 p. (MIRA 11:9)
(Cigarette industry--Equipment and supplies)

LEONCHIK, B. I., Cand of Tech Sci — (diss) "Experimental Investigation of the Process of Drying of Over-heated Solutions by Means of Spraying," Moscow, 1959, 18 pp Moscow Power Engineering Institute) (KL, 4-60, 119)

5(2) SOV/143-59-2-14/19

AUTHORS: Lebedev, P.D., Professor, Doctor of Technical Sciences; Verba, M.I., Docent, Candidate of Technical Sciences; Leonchik, B.I.; Portnov, V.D. and Sadchikov, O.V., Engineers

TITLE: The Drying of Heated, Inorganic Solutions by Means of Spraying (Sushka raspyleniyem podogretykh neorganicheskikh rastvorov)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - Energetika, 1959, Nr 2, pp 111-116 (USSR)

ABSTRACT: When drying heat-resistant, inorganic solutions by spraying them into a stream of hot flue gases, the heat and mass exchange processes may be considerably intensified by heating the solution to a temperature somewhat below its boiling point prior to spraying, maintaining an adequate pressure in the pipeline. A more intensive dehydration is observed with a sudden reduction of the pressure of the heated liquid when the latter leaves the sprayer. The dehydration process is achieved, by the heat of

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the drying agent (flue gas), and by the interior heat of the atomized particles. The preliminary heating of the solution causes a reduction of the viscosity and surface tension, and consequently, it changes the character of the intermediate-phase surfaces and with them the spray dispersion. Thereby the basic laws are disturbed which are valid for the dispersion of a cold liquid flow. For investigating the basic thermal and hydrodynamic peculiarities of this drying process, an experimental, semi-industrial drying chamber was built at the Kafedra sushil'nykh i teploobmennykh ustroystv MEI (Chair of Drying and Heat-Exchange Equipment of MEI). The drying chamber was built in such a way that one parameter of the process could be changed while all the others were kept constant. Provisions were made to perform the drying in a direct flow and in a counterflow of flue gas, or to feed the drying gases from the sides of the chamber. Figure 1 shows a diagram of the drying unit. The basic series of

tests was conducted with centrifugal sprayers. A total of 60 experiments was made for which a 50% salt solution was used as experimental liquid. The liquid consumption was changed from 70-260 kg/h, the temperature of the liquid was varied from 75-300°C, the pressure of the liquid from 50-150 atm. The temperature of the flue gases was varied from 190-550°C. Kerosene was used as a fuel for heating the drying chamber. Since preliminary heating of the liquid causes a faster crystallization of the dispersed particles, the interaction of the flue gas components with the product is less intensive than when using a cold liquid. The increase of the sulfur content of the dried material did not exceed the maximum permissible value of 0.06% $SO_4$. The processing of the experimental data and their analysis showed that the most favorable drying conditions were obtained at a liquid temperature of 280°C, and at an initial gas temperature of 460°C. The irrigation factor was 0.1 kg of the solution per kg

The Drying of Heated, Inorganic Solutions by Means of Spraying

of dry gas. The specific fuel consumption for 1 kg of the product was 200-250 g/kg - product. The mass exchange factor was 12-20 kg/m³ hour. When spray drying cold liquids the mass exchange factor at the same temperature of flue gases amounted to 8-12 kg/m³ hour. The effectiveness of interphase surface which means the dispersion of atomized particles. So far, peculiarities of flowing out and disintegrating of a heated liquid stream were not considered in the works of Soviet and foreign scientists. The authors established some characteristical hydrodynamic phenomena of this process and some calculated suggestions for the design of sprayers will be subject of future investigations. The authors mention only the four types of sprayers used during their experiments: a centrifugal sprayer with one tangential inlet, a centrifugal sprayer with two tangential inlets, a centrifugal sprayer with a special conical atomizer and a conical nozzle. The

VERBA, M.I., kand.tekhn.nauk; ISAYEV, V.S., inzh.; LEONCHIK, B.I., inzh.

Effect of the heat-transfer coefficients and the substance on the drying process of building bricks. Izv.vys.ucheb.zav.; energ. 2 no.4:109-114 Ap '59. (MIRA 12:9)

1. Moskovskiy ordena Lenina energeticheskiy institut. Predstavlena kafedroy sushil'nykh i teploobmennykh ustroystv.
(Bricks--Drying)

11(2) SOV/143-59-3-14/20

AUTHORS: Verba, M.I., Candidate of Technical Sciences, Leonchik, B.I., Engineer

TITLE: The Calculation of Spray Drying Equipment (O raschete raspylitel'nykh sushilok)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniya - Energetika, 1959, Nr 3, pp 108-113 (USSR)

ABSTRACT: The investigation of spraying processes is a very complicated problem. Spraying processes are used, for example, in drying equipment, internal combustion engines, jet engines, scrubbers. The investigation of spraying problems may be divided into two sections: 1) the investigation of spraying hydrodynamics, and 2) the investigation of heat and mass exchange laws of the atomized matter in a surrounding gas medium. Regardless to the great achievements made in studying the hydrodynamics of the spraying process, there is a very limited number of relations suitable for practical calculations. In this connection the authors review about 20 Soviet publications dealing with these

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SOV/143-59-10-13/22

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AUTHORS: Lebedev, P.D., Doctor of Technical Sciences, Professor, and Verba, M.I., Candidate of Technical Sciences, Leonchik, B.I., Engineer

TITLE: Laws Governing The Atomizing of a Superheated Liquid

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Energetika, 1959, Nr 10, pp 76-83

ABSTRACT: The results of an investigating of the hydrodynamic peculiarities of atomizing superheated liquids are published in this article. When heating a solution to a temperature of 300-330°C (preventing boiling by applying the proper pressure in the pipeline) prior to atomizing, the specific volume increases by approximately 1.5 times, the kinematic viscosity decreases (by 6-5 times) and the surface tension is less (by 10-12 times). Peculiar hydrodynamic conditions are created by the practically instantaneous boiling of the superheating liquid upon leaving the atomizer. They determine the structure of the spray cone and influence the seconda-

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Laws Governing The Atomizing of a Superheated Liquid

ry dispersion of the drops. The process of atomizing superheated solutions differs considerably from the atomizing of a cold liquid due to changes in thermophysical and hydromechanical conditions. The investigations were performed on an experimental installation which was different from the one described by the same authors [Ref 1] only in performing the atomization in a cylindrical, vertical drying chamber of 800 mm diameter and 2.3 m height. Preliminary tests [Ref 1] showed that a conical nozzle had the best characteristic as an atomizer, creating a very high degree of dispersion and greater spray cone angles of the atomized matter. Its design is simple compared to other atomizer types. Geometrically similar nozzles with different diamters of the minimum profile were used (0.28, 0.35, 0.44, 0.63, and 0.805 mm). The flow factor for these nozzles was 0.8-0.95, depending upon the temperature of the solution and increasing together with it. The liquid to be atomized consisted of

Laws Governing The Atomization of a Superheated Liquid

ordinary water and an inorganic salt solution having a specific gravity of 1.36 (concentration 500 g/l). The investigations were conducted at pressures of 90-150 atmospheres and at liquid temperatures of 160-320° C. The dispersion of drops and the density of the spray were investigated by microphotographs and other aids. The formation of drops in the spray cone is a result of a complicated separation and fusion process of the primary drops. The pulsation of the drop motion, and the impossibility of formulating boundary conditions in the development of the process exclude a complete analytical solution of this problem. Theoretical investigations of G.I. Petrov and T.D. Kalinina [Ref 6], B.D. Katsnel'son and V.A. Shvab [Ref 5] and other investigators show the possibility of using existing equations, describing the disintegration process of a flow with the aid of the theory of similarity. The authors of this paper noticed a practically constant flow of the superheated liquid thru the conical nozz-

LEONCHIK, B. I. and KEBEDEB, P. D.

"Spray drying of superheated solutions."

Report presented at the 1st All-Union Conference on Heat- and Mass Exchange, Minsk, BSSR, 5-9 June 1961

VERBA, M.I., kand.tekhn.nauk; LEONCHIK, B.I.

Psychometric method for measuring pressures. Izv.vys.ucheb.zav.; energ. 4 no.4:122-123 Ap '61. (MIRA 14:5)

1. Moskovskiy ordena Lenina energeticheskiy institut. Predstavlena kafedroy sushil'nykh i teploobmennykh ustanovok.
(Pressure gauges)

VERBA, M.I., kand.tekhn.nauk; LEONCHIK, B.I.

Calculation of evaporation in spray drying of overheated solutions. Izv. vys. ucheb. zav.; energ. 4 no.7:76-78 Jl '61. (MIRA 14:7)

1. Moskovskiy ordena Lenina energeticheskiy institut. Predstavlena kafedroy sushil'nykh i teploobmennykh ustanovok.
(Drying apparatus) (Solution (Chemistry))--Drying)
(Heat--Transmission)

VERBA, M.I., kand.tekhn.nauk; LEONCHIK, B.I., kand.tekhn.nauk

New method of drying solutions by spraying. Prom.energ. 16 no.6: 4-7 Je '61. (MIRA 15:1)
(Solution (Chemistry)) (Drying)

LEONCHIK, B.I., kand.tekhn.nauk; YEREMENKO, F.M., inzh.

Concerning the use of the pressure drop in the measuring hoppers of pneumatic and hydraulic transportation systems. Izv. vys. ucheb. zav.; energ. 5 no.2:106-107 F '62. (MIRA 15:3)

1. Moskovskiy ordena Lenina energeticheskiy institut.
(Hydraulic conveying) (Pneumatic-tube transportation)

VERBA, M.I., kand.tekhn.nauk; LEONCHIK, B.I., kand.tekhn.nauk; PAVLOVSKIY, L.L., inzh.

Determination of optimum conditions for the drying of paint coatings. Izv. vys. ucheb. zav.; energ. 5 no.3:76-80 Mr '62. (MIRA 15:4)

1. Moskovskiy ordena Lenina energeticheskiy institut. Predstavlena kafedroy sushil'nykh i teploobmennykh ustroystv.
(Protective coatings)

LYKOV, M.V.; LEONCHIK, B.I.; DANILOV, O.L.

How to intensify atomizing drying. Inzh.-fiz.zhur. 5 no.12:34-40 D '62. (MIRA 16:2)

1. Energeticheskiy institut, Moskva.
(Drying)

LEONCHIK, B.I.; PAVLOVSKIY, L.L.

Infrared radiation generators with electric heating for radiant heat dryer systems. Lakokras.mat.i ikh prim. no.6:61-66 '62. (MIRA 16:1)

1. Moskovskiy energeticheskiy institut i Nauchno-issledovatel'skiy institut tekhnologii lakokrasochnykh pokrytiy.
(Infrared drying apparatus)

LEBEDEV, Panteleymon Dmitriyevich; MIKHAYLOV, N.M., prof., retsenzent; GINZBURG, A.S., prof., retsenzent; LIKOV, M.V., dots., nauchnyy red.; LEONCHIK, B.I., dots., nauchnyy red.; LARIONOV, G.Ye., tekhn. red.

[Calculation and design of drying systems]Raschet i proektirovanie sushil'nykh ustanovok. Moskva, Gosenergoizdat, 1963. 319 p. (MIRA 16:3)

(Power engineering) (Drying)

LEONCHIK, B.I., kand. tekhn. nauk

Analysis of energy and mass transfer in the vertical chambers of pulverizing drying apparatus and capless scrubbers. Trudy MEI no.48:15-22 '63. (MIRA 17:6)

LEONCHIK, B. I.

"Analysis of heat and mass transfer in sprayer chambers of dryers and scrubbers."

report submitted for 2nd All-Union Conf on Heat & Mass Transfer, Minsk, 4-12 May 1964.

Moscow Power Inst.

LEONCHIK, B.I., kand.tekhn.nauk; LYKOV, M.V., kand.tekhn.nauk

Transducer for monitoring the operation of superheated solution atomizers in drying apparatus. Izv.vys.ucheb.zav.; energ. 7 no. 4:102-104 Ap '64. (MIRA 17:5)

1. Moskovskiy ordena Lenina energeticheskiy institut. Predstavlena kafedroy sushil'nykh i teploobmennykh ustroystv.

LYKOV, M.V., kand. tekhn. nauk, dotsent; LEONCHIK, B.I., kand. tekhn. nauk, dotsent; DANILOV, O.L., inzh.

Use of low-pressure superheated steam as a drying agent. Izv. vys. ucheb. zav.; energ. 7 no.8:70-75 Ag '64. (MIRA 17:2)

1. Moskovskiy ordena Lenina energeticheskiy institut. Predstavlena kafedroy sushil'nykh i teploobmennykh ustroistv.

L 61932-65
ACCESSION NR: AP5019080 UR/0286/65/000/012/0104/0104 8 B

AUTHORS: Leonchik, B. I.; Lebedev, P. D.; Danilov, O. L. 44

TITLE: A method for measuring the mean velocity of the motion of particles in a stream of broadly dispersed gas suspensions. Class 42, No. 172139

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 12, 1965, 104

TOPIC TAGS: particle motion, velocity measurement

ABSTRACT: This Author Certificate presents a method for measuring the mean velocity of motion of particles in a stream of broadly dispersed gas suspensions. To simplify the measuring process, the particles are weighed consecutively. Some of the particles are captured in an immobile trap, some in a trap moving at a constant velocity against the stream. The particle velocity is determined from the difference in the weights of the particles captured in the movable and the immobile traps.

ASSOCIATION: none

SUBMITTED: 19Jun64 ENCL: 00 SUB CODE: NP,ME

NO REF SOV: 000 OTHER: 000

Card 1/1 gle

L 65127-65 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l)/ETC(m)

ACCESSION NR: AP5021606 UR/0286/65/000/013/0077/0077

AUTHORS: Leonchik, B. I.; Danilov, O. L. 12 7

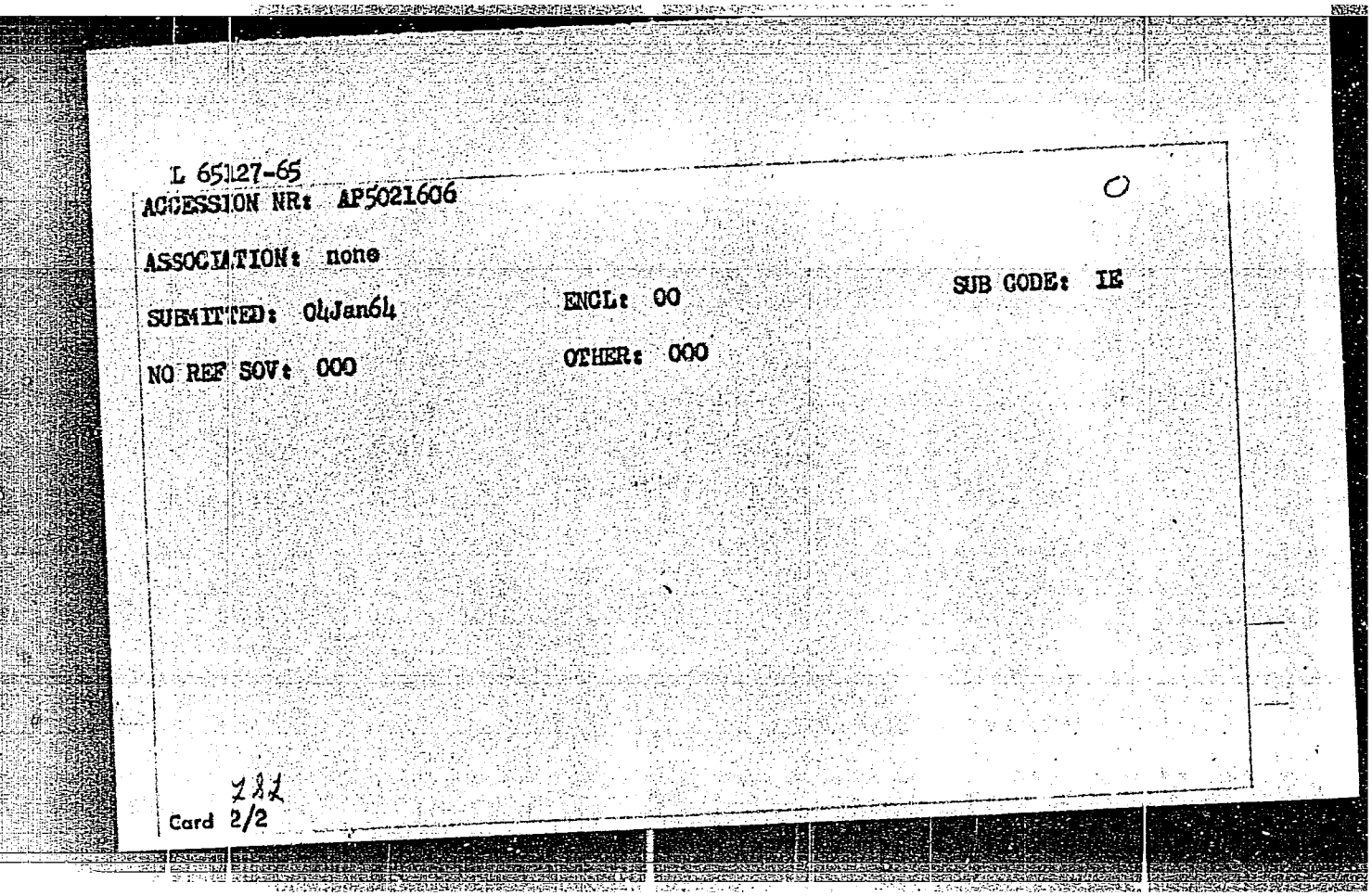
TITLE: A method for measuring the temperature of nonsimilar streams. Class 42, No. 172517

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 13, 1965, 77

TOPIC TAGS: measuring instrument, temperature measurement, fluid temperature

ABSTRACT: This Author Certificate presents a method for measuring the temperature of nonsimilar streams, for instance, of gases or liquids, containing dispersed liquids or solid particles. To improve the measurement accuracy, an auxiliary uniform stream with regulated temperature is introduced into the original stream through an adapter. The temperature of the original stream is determined at the moment when the minimum difference is reached between the temperatures measured in the original stream and at the zone of the adapter outlet. To eliminate the influence of the wetting liquids or of adhering particles, the temperature gauges placed in the original stream are continuously wetted by a volatile liquid such as acetone.

Card 1/2



L 65127-65

ACCESSION NR: AP5021606

ASSOCIATION: none

SUBMITTED: 04Jan64 ENCL: 00 SUB CODE: IE

NO REF SOV: 000 OTHER: 000

Card 2/2

LEONCHIK, B.I., kand.tekhn.nauk, dotsent; DANILOV, O.L., inzh., aspirant; USTINOVA, Ye.T., starshiy nauchnyy sotrudnik

Selecting the methods for drying bonded nonwoven fabrics. Tekst. prom. 25 no.1:55-59 Ja '65. (MIRA 18:4)

1. Moskovskiy energeticheskiy institut (for Leonchik, Danilov).
2. TSentral'nyy nauchno-issledovatel'skiy institut khlopchato-bumazhnoy promyshlennosti (for Ustinova).

LYKOV, A.V.; LEBEDEV, P.D.; VUKALOVICH, M.P.; GINZBURG, A.S.; SMOL'SKIY, B.M.; SOKOLOV, Ye.Ya.; SEMENENKO, N.A.; LYKOV, M.V.; LEONCHIK, B.I.; KRASNIKOV, V.V.; SHUMAYEV, F.G.; DREVS, G.V.

Georgii Aleksandrovich Maksimov; obituary. Inzh.-fiz. zhur. 9 no.3:418 S '65. (MIRA 18:9)

L 44227-66 EWT(l)/EWP(m)/EWT(m)/T IJP(c) DS/WW/JW/WE

ACC NR: AP6024636 SOURCE CODE: UR/0170/66/011/001/0037/0041

AUTHOR: Lebedev, P. D.; Leonchik, B. I.; El'perin, I. T.

ORG: Power Engineering Institute, Moscow (Energeticheskiy Institut); Heat and Mass Transfer Institute, AN BSSR, Minsk (Institut Teplo- i Massoobmena AN BSSR)

TITLE: Determination of transport potential fields in flow of coarsely dispersed gas suspensions

SOURCE: Inzhenerno-fizicheskiy zhurnal, v. 11, no. 1, 1966, 37-41

TOPIC TAGS: combustion, spray flame, two phase flow, gas flow, energy transport, calorimeter

ABSTRACT: A theoretical and experimental study was made of the interphase energy transport in coarsely dispersed systems. In the analysis, the flow of the two-phase system was considered to be quasi-homogenous with sources and sinks of matter. The redistribution of the potentials (temperature gradient, chemical potential, energy flux) takes place due to the interaction of the phases. A differential calorimeter is described for determining the mean particle temperature on the basis of a compensation method. The generalized data on the local transport processes can be used for calculating spray flames. Orig. art. has: 4

Card 1/2 UDC: 541.182.2/.3

L 44227-66

ACC NR: AP6024636 O

formulas and 2 figures.

SUB CODE: 20,21/ SUBM DATE: 03Jan66/ ORIG REF: 014

Card 2/2 MT

LEONCHIK, Ye. A.

Cand Med Sci - (diss) "Materials on the study of vascular reactivity in patientis with hypertonic disease." Stalingrad, 1961. 18 pp; (Ministry of Public Health RSFSR, Stalingrad State Med Inst); 200 copies; free; (KL, 6-61 sup, 238)

KOMAROV, V.A.; CHERNIKOVA, Ye.A.; KOMAROV, G.V.; LEONCHIK, Z.I.

Mechanism of the catalytic action of metal oxides in the reaction of decomposition of formic acid. Vest. LGU 15 no.16:120-133 '60.
(MIRA 13:8)

(Metallic oxides) (Formic acid)
(Catalysts)

KOMAROV, V. A.; CHERNIKOVA, Ye. A.; KOMAROV, G. V.; LEONCHIK, Z. I.

Mechanism of the catalytic action of metallic oxides in the reaction of decomposition of formic acid. Part 1: Composition of the reaction products. Zhur. fiz. khim. 36 no.12:2577-2581 D '62. (MIRA 16:1)

1. Leningradskiy gosudarstvennyy universitet imeni Zhdanova.

(Formic acid) (Metallic oxides) (Catalysis)

KNYSH, I.T., dotsent; LEONCHUK, A.S., kand. med. nauk; MONBLANOV, V.V., kand. med. nauk

Comparative evaluation of the treatment of pseudoarthrosis and defects of long tubular bones. Ortop., travm. i protez. 25 no.6: 27-31 Je '64. (MIRA 18:3)

1. Iz kafedry ortopedii (zav. - prof. A.G. Yeletskiy) Kiyevskogo meditsinskogo instituta (dir. - dotsent V.D. Bratus') i Ukrainskogo instituta ortopedii i travmatologii (dir. - dotsent I.P. Alekseyenko).

LEONCHUK, G.S.

Late results of surgery in treating habitual dislocation of the shoulder. Ortop.,travm.i protez. 20 no.12:15-18 D '59.
(MIRA 13:5)

1. Iz kafedry ortopedii i travmatologii (zav. - prof. A.G. Yeletskiy) Kiyevskogo ordena Trudovogo Krasnogo Znameni meditsinskogo instituta (dir. - dotsent I.P. Alekseyenko) i Ukrainskogo nauchno-issledovatel'skogo instituta ortopedii i travmatologii v gorode Kiyeve (i.o. direktora - N.N. Musnenko).
(SHOULDER fracture & dislocation)

L 19002-65 EWT(d)/EPF(n)-2/EWP(1) Pg-4/Pk-4/Pl-4/Po-4/Pq-4/Pu-4 AFWL/AFETR/ASD(f)-2/ASD(a)-5/ESD(dp)/IJP(c) WW/BC

ACCESSION NR: AP5001459 S/0208/64/004/006/1112/1117

AUTHOR: Leonchuk, M. P. (Moscow) 13

TITLE: Numerical solution of problems on optimal processes with distributed parameters

SOURCE: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 4, no. 6, 1964, 1112-1117

TOPIC TAGS: numerical analysis, optimal control, differential equation

ABSTRACT: The author uses standard techniques for obtaining numerical solutions of three specific optimal control problems with distributed parameters. He approximates partial differential equations by ordinary differential equations and makes use of Pontryagin's maximum principle. Tables of values computed for different numbers of iterations are presented. "In conclusion the author expresses his deep gratitude to V. A. Ditkin for his constant attention to this work." Orig. art. has: 24 formulas and 4 tables.

ASSOCIATION: none

SUBMITTED: 02Apr64 ENCL: 00

SUB CODE: IE, MA NR REF SOV: 005 OTHER: 004

Card 1/1

L 57072-65 EWT(m)/EPF(c)/EPF(n)-2/EWG(m)/EPR Pr-4/Ps-4/Pu-4 WM
ACCESSION NR: AP5014762 UR/0208/65/005/003/0558/0561
517.9 : 621.039

AUTHORS: Leonchuk, M. P. (Moscow); Trofimov, A. S. (Moscow); Kurbatov, I. M. (Moscow) 33 34 B

TITLE: On a numerical solution of one problem involving optimal control of a nuclear reactor

SOURCE: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 5, no. 3, 1965, 558-561

TOPIC TAGS: approximation method, nuclear reactor, reactor power, reactor control, reactor operation/ Strela computer

ABSTRACT: A method is presented for determining the values of reactor parameters such that optimal control of the reactor processes is achieved. The state of the reactor is described by a system of equations including time derivatives with limitations both on the control equations and on the system solution. The system is reduced to a system of ordinary equations by means of direct and integral relationships. An example is given for establishing optimal control of temperature of heat exchangers by exercising control of three parameters: the reactor potential q, the discharge G, and inlet temperature θ. The system is expressed by the hyperbolic equation system with first order time derivatives

Card 1/2

NO REF SOV.

Card 2/2



L 57072-65 EWT(m)/EPF(c)/EPF(n)-2/EWG(m)/EPR Pr-4/Ps-4/Pu-4 WM
ACCESSION NR: AP5014762 UR/0208/65/005/003/0558/0561
517.9 : 621.039

AUTHORS: Leonchuk, M. P. (Moscow); Trofimov, A. S. (Moscow); Kurbatov, I. M. (Moscow) 33 34 B

TITLE: On a numerical solution of one problem involving optimal control of a nuclear reactor

SOURCE: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 5, no. 3, 1965, 558-561

TOPIC TAGS: approximation method, nuclear reactor, reactor power, reactor control, reactor operation/ Strela computer

ABSTRACT: A method is presented for determining the values of reactor parameters such that optimal control of the reactor processes is achieved. The state of the reactor is described by a system of equations including time derivatives with limi-

L 57072-65

ACCESSION NR: AP5014762

$$\frac{\partial\theta}{\partial\tau}+G(\tau)\frac{\partial\theta}{\partial z}=Ku+(1-G(\tau))\eta(z),$$
$$\frac{\partial u}{\partial\tau}+\xi\frac{\partial\theta}{\partial\tau}+K\psi u=\psi q(\tau)\eta(z);$$

where $\theta(\tau,z)$, $u(\tau,z)$ is the dimensionless temperature of the heat exchanger and the temperature head. The optimality problem is solved in two ways: by the method of integral relationships, and by the linear method. Solutions by the iterative methods defined are demonstrated both graphically and by means of a test case solved on a Strela computer. The computed discharge curves proved sufficiently smooth and may be used for selection of the operating speed of a circulation pump. The authors thank V. A. Ditkin for his constant interest and attention to the work. Orig. art. has: 2 figures and 11 equations.

ASSOCIATION: none

SUBMITTED: 09Nov64 ENCL: 00 SUB CODE: NP, IE

NO REF SOV: 003 OTHER: 000



Card 2/2

L 13823-66 EWT(m)/ETC(F)/EPF(n)-2/EWG(m)/T WW/DJ
ACC NR: AP6001800 SOURCE CODE: UR/0089/65/019/006/0537/0540

AUTHOR: Kurbatov, L.M.; Leonchuk, M.P.; Trofimov, A.S. 46

ORG: none

TITLE: The optimum control of thermal processes in nuclear reactors 19

SOURCE: Atomnaya energiya, v. 19, no. 6, 1965, 537-540

TOPIC TAGS: nuclear reactor operation, nuclear reactor ~~characteristic~~, nuclear reactor control, optimal control

ABSTRACT: The authors studied earlier (Zh. vychisl. matematiki i matem. fiziki, 5, 558, 1965) the optimum response control of transient thermal processes in nuclear reactors. The control was carried out by changing the flow of the coolant G(τ). The present note is a continuation of the investigation of the dynamic properties of the thermal model of nuclear reactors serving as a component of the control system. The influence of heat exchangers, circulation pumps, and other components on the transient processes in the reactor is not taken into account. For a given linear law of reactor power change q(τ) a determination is made of G(τ) to assure, during the transient process, the minimum deviation from the linear temperature variation at the output. The same problem is also considered for arbitrary q(τ). The results are given as curves of optimum reactor power increase and decrease for different reactor parameters. Two separate families of curves correspond to the minimum transient

Card 1/2 UDC:621.039.56

L 13823-66

ACC NR: AP6001800

time and minimum output temperature deviation criteria. Orig. art. has: 18 formulas and 2 figures.

SUB CODE: 20 / SUBM DATE: 13Feb65 / ORIG REF: 004

Card 2/2

VINITSKIY, K.Ye.; REYENTOVICH, F.I.; LEONCHUK, M.P.

Optimalizing loading and hauling operations in strip mines by the nonlinear programming method. Ugol' 40 no.4:49-52 Ap '65. (MIRA 18:5)

1. Institut gornogo dela im. A.A. Skochinskogo (for Vinitskiy, Reyentovich). 2. Vychislitel'nyy tsentr AN SSSR (for Leonchuk).

L 25[illegible]-66 T JK

ACC NR: AP6026860 SOURCE CODE: RU/0023/66/011/002/0173/0179

AUTHOR: Vladescu, Ana--Vladesku, A. (Doctor); Leondari, V. (Doctor); Rindasu, Georgeta--Ryndashu, D. (Doctor)

ORG: Department of Microbiology, Faculty of Stomatology /headed by V. Bilbiie/ (Disciplina de microbiologie a Facultatii de stomatologie

TITLE: Contributions to the study of experimental infection with Candida albicans in the white mouse

SOURCE: Microbiologia, parazitologia si epidemiologia, v. 11, no. 2, 1966, 173-179

TOPIC TAGS: saccharomyces, pulmonary disease, dermatology

ABSTRACT: The authors found on the basis of the experimental work reported that white mice are the most suitable laboratory animals in which to induce a generalized Candida infection, and that the determination of the $DL_{50}$ for white mice is a scientific means for determining the virulence of Candida albicans strains. The Candida albicans cultures were collected by the Laboratory of Microbiology, Faculty of Stomatology. Orig. art. has: 1 table. [Based on authors' Eng. abst.] [JPRS: 36,834]

SUB CODE: 06 / SUBM DATE: 10Dec64 / ORIG REF: 003 / SOV REF: 002
OTH REF: 018

Card 1/1 UDC: 616-002.828.223.2-092.9

BILBIE, V., conf.; RACOVITA, Cl., dr.; THOMAS, Emilia; LEONDARI, V., dr.; DUMITRESCU, Gabriela, dr.;

Possibilities, difficulties, and prospects in the microbiologic diagnosis of urogenital tuberculosis. Microbiologia (Bucur) 6 no. 1:33-45 Ja-F '62.